



May 12, 2022

Randy Bates
Director, Division of Water
Alaska Department of Environmental Conservation
555 Cordova Street, Anchorage, AK 99501-2617
Email: randy.bates@alaska.gov

RE: Donlin Gold Response to Earthjustice’s ‘Donlin Gold Certificate of Reasonable Assurance’ Letter (May 9, 2022)

Dear Mr. Bates:

Donlin Gold LLC (Donlin) respectfully requests that the Division of Water (the Division) consider the following response and memoranda pursuant to the Order Granting Interlocutory Remand in *Orutsararmiut Native Council v. Alaska Department of Environmental Conservation*, No. 3AN-21-06502CI (Dec. 29, 2021). On May 9th, 2022 Earthjustice on behalf of Orutsararmiut Native Council (ONC) submitted a letter and three technical memoranda in response to Donlin’s April 14th comments.

To ensure the Division proceeds with its review of Donlin’s Certificate of Reasonable Assurance with a clear understanding of the analyses and methodologies presented in those reports, Donlin submits the following:

1. A memorandum¹ prepared by BGC Engineering Inc. responding to Dr. Tom Myers, “Response to BGC Engineering, Review of BGC’s Crooked Creek Stream Temperature Analysis—Response” (Apr. 29, 2022).
2. A memorandum² prepared by Ramboll US Consulting, Inc. responding to Dr. Glenn C. Miller, “Response to Comments on Mercury Releases from the Proposed Donlin Mine” (May 8, 2022).

¹ BGC Engineering Inc., “Review of BGC’s Crooked Creek Stream Temperature Analysis — Follow-up Response” (May 12, 2022), included as Attachment 1 to this letter.

² Ramboll US Consulting, Inc., “Response to Mercury Comments in Letter from Orutsararmiut Native Council dated May 9, 2022” (May 11, 2022), included as Attachment 2 to this letter.

3. A memorandum³ prepared by Air Sciences Inc. also responding to Dr. Glenn C. Miller, “Response to Comments on Mercury Releases from the Proposed Donlin Mine” (May 8, 2022).

Also, in response to Dr. David Chambers’s general comment included with his May 5th, 2022 letter⁴ arguing that it could be difficult to use the water treatment effluent as a potential mitigation measure to address any project-caused exceedances of the water quality standard for temperature in Crooked, we highlight the following:

- First, cooling of the water treatment plant effluent is listed as a *potential* mitigation measure, only if needed, since BGC’s analysis of the temperature and flow data indicates that it is likely that the project would not cause exceedances of the temperature standard. Second, as Dr. Chambers notes, approximately 50 percent of the water treatment plant influent will be pumped groundwater from dewatering operations and this percentage could be increased to as much as 80 percent. In its memorandum dated April 14, 2022, BGC noted that the average temperature of the groundwater in the project area is 35.6°F, approximately 20°F lower than the standard. An additional, approximately 24 percent of the influent water is pumped from the tailings storage facility (TSF) seepage recovery system (SRS), which should also have temperatures roughly comparable to the groundwater. Therefore, more than 70 percent of the total influent inflows to the water treatment plant will be much colder than the standard.
- While the relatively small amounts of contact pond water and minimal flows of tailings pond water could be subject to some warming in the ponds, their thermal contributions should be very low compared to the cold groundwater inflows.
- The water treatment plant does not include any elements that would substantially increase the influent temperature during the treatment process.
- Dr. Chambers states that it is unclear that the water could be cooled prior to discharge, in the unlikely event that it is needed. We respectfully disagree in that it would be straightforward to either add chillers or other cooling systems, if needed.

Donlin appreciates the opportunity to submit the attached materials and is available to answer any questions the Division may have during its review. Thank you for your time and consideration.

³ Air Sciences Inc., “Review of May 9, 2022 Comments from Earthjustice” (May 12, 2022), included as Attachment 3 to this letter.

⁴ Response to BGC Engineering—Temperature of Treated Effluent” (May 5, 2022).

Randy Bates
May 12, 2022

Sincerely,

A handwritten signature in black ink that reads "Enrique Fernandez". The signature is written in a cursive, flowing style.

Enrique Fernandez
Permitting and Environmental Manager

CC: Dan Graham, General Manager – Donlin Gold LLC
Eric Fjelstad, Attorney for Donlin Gold – Perkins Coie LLP
Jim Leik, Attorney for Donlin Gold – Perkins Coie LLP

ATTACHMENT 1

BGC Engineering Inc., “Review of BGC’s Crooked Creek Stream Temperature Analysis
— Follow-up Response” (May 12, 2022),

Project Memorandum

To: Perkins Coie **Doc. No.:**
Attention: Eric Fjelstad **cc:** Ron Rimelman
Enric Fernandez

From: Hamish Weatherly **Date:** May 12, 2022
Subject: Review of BGC's Crooked Creek Stream Temperature Analysis –
Follow-up Response

Project No.: 0011341

1.0 INTRODUCTION

In the spring of 2021, BGC Engineering Inc. (BGC) was retained by Donlin Gold to complete a quantitative analysis to define potential changes in Crooked Creek stream temperatures that may occur because of the proposed Donlin Gold Project (Project). Results of that analysis and the methodology used by BGC were provided to Donlin Gold in a draft report dated September 28, 2021. That report was subsequently submitted to the Alaska Department of Environmental Conservation (ADEC) for their consideration. ADEC also submitted the report to the Orutsarmiut Native Council (ONC) for comment, pursuant to the Order Granting Interlocutory Remand in *Orutsarmiut Native Council v. Alaska Department of Environmental Conservation*, No. 3AN-21-06502CI (Dec. 29, 2021).

Comments on BGC's September 28, 2021 report were received from Earthjustice (on behalf of the ONC) on March 29, 2022. Those comments include Exhibit 6, a technical memorandum prepared by Tom Myers, Ph.D. for Earthjustice. Dr. Myer's memorandum provides a technical review of BGC's analysis of potential changes in Crooked Creek stream temperatures that may occur because of the proposed Project. Donlin Gold subsequently requested that BGC respond to Dr. Meyer's review comments. Those responses were documented in a BGC memorandum dated April 14, 2022. Dr. Meyer then responded to BGC's response of April 14, 2022 with a technical memorandum dated April 29, 2022.

The intent of this memorandum is not to respond to each of Dr. Meyer's response comments, but rather to re-iterate details of the analysis previously provided by BGC.

2.0 DISCUSSION

In his latest response letter, Dr. Meyer primarily advocates for the calculation and use of the 10-year low flow. It is not clear what purpose that calculation would serve, as there would not be associated water temperatures with that estimate. He also re-iterates his position of potential thermal effects between model nodes due to reduced flows increasing the ratio of stream surface to flow area. The estimated reduction of flow in Crooked Creek due to activities in American Creek is minor relative to the total flow in Crooked Creek.

A process-based stream temperature model could be employed to analyze the factors advocated by Dr. Meyer. However, such a model would have much more uncertainty associated with the various required inputs than the use of actual data. It is therefore reiterated herein that we consider the use of actual data to be a strong foundation for assessing likely future compliance with water quality standards. It is clearly recognized that BGC's analysis does not include every possible combination of streamflow and stream temperature, given both the type of analysis conducted and the length of record available (2005, 2006, 2007, 2009 and 2011). However, we do not consider it productive to replace the actual data with a process-based stream temperature model that would have significant uncertainty associated with its various inputs.

3.0 CLOSURE

BGC Engineering Inc. (BGC) prepared this document for the account of Perkins Coie. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

A record copy of this document is on file at BGC. That copy takes precedence over any other copy or reproduction of this document.

Yours sincerely,

BGC ENGINEERING INC.

per:

A handwritten signature in black ink, appearing to read 'H. Weatherly', with a stylized flourish at the end.

Hamish Weatherly, M.Sc., PG
Principal Hydrologist

HW

REFERENCES

- BGC Engineering Inc. (2022, April 14 28). *Review of BGC's Crooked Creek Stream Temperature Analysis – Response* [Memorandum]. Prepared for Perkins Coie.
- BGC Engineering Inc. (2021, September 28). *Donlin Project, Analysis of Crooked Creek Streamflow Temperature (Draft)* [Report]. Prepared for Donlin Gold LLC.
- Earthjustice. (2022, March 29). *Donlin Gold Mine Certificate of Reasonable Assurance*. Letter to Alaska Department of Environmental Conservation, Division of Water.
- Myers, T. (2022, April 29). *Response to BGC Engineering, Review of BGC's Crooked Creek Stream Temperature Analysis - Response* [Technical Memorandum]. Prepared for Earthjustice.
- Myers, T. (2021, November 24). *Surface Water Temperature Effects of the Proposed Donlin Project* [Technical Memorandum]. Prepared for Earthjustice.

ATTACHMENT 2

Ramboll US Consulting, Inc., “Response to Mercury Comments in Letter from Orutsarmiut Native Council dated May 9, 2022” (May 11, 2022),

MEMO

To: Enric Fernandez, Donlin Gold; Ron Rimelman, Novagold; Eric Fjelstad, Perkins Coie

From: Krish Vijayaraghavan, Christopher Stubbs, and Alison O'Connor, Ramboll

RE: Response to Mercury Comments in Letter from Orutsararmiut Native Council dated May 9, 2022

The primary focus of Dr. Miller's comments is on tailings mercury emissions. As discussed in the Ramboll response to comments dated April 14, 2022, changes to the tailings storage facility pond emissions would not have a material impact on the Project's water quality impact predictions because these emissions constitute a relatively small fraction of total Project emissions and the atmospheric loading contribution to the creek mercury loading is very small compared to geogenic loading in this region.

Date May 11, 2022

Nevertheless, we offer below a response to Dr. Miller's main comments in the letter dated May 9, 2022.

Ramboll
7250 Redwood Boulevard
Suite 105
Novato, CA 94945
USA

- **Response to comments related to "reliance on single value", sunlight, cyanide, variability and uncertainty**

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<https://ramboll.com>

The Ramboll modeling and analysis provides reasonable science-based estimates using best available site-specific data, the peer-reviewed literature, and information from other existing mines as appropriate. Specifically, the analysis uses mercury concentration data from Donlin Gold ore, solar radiation, waste rock and water quality data at the Donlin Gold site, and mercury tailings concentration data from the Donlin Gold pilot processing study which accounted for cyanide treatment. The temporal variability in emissions noted by Dr. Miller (e.g., variability due to sunlight and changes in cyanide/mercury concentrations) is on the timescale of days to months while the impact on creek concentrations is on the timescale of tens to hundreds of years due to retention in soils as discussed in the Ramboll (October 2021) report. Therefore, deposition resulting from a spike in emissions such as emission from tailings facility thaws would not immediately cause an increase in soil and creek concentrations; rather the latter are driven by longer-term average emissions. Moreover, to account for uncertainties in the data, the Ramboll study applied a series of conservative assumptions as discussed in the October 2021 report and in the April 2022 response to comments.

- **Response to comments related to the UNR reagent**

The performance of the UNR reagent is not used in the calculations and was discussed only to note the inherent additional conservatism present in the modeling and analysis.

- **Response to comments related to differences from the Nevada mines**

As discussed in the Ramboll report, site conditions are very different at Donlin Gold and the Nevada mines. For example, the ore mercury concentration is more than an order of magnitude higher at Twin Creeks than Donlin Gold. Solar radiation is lower at Donlin Gold and there is significant ice cover in winter, both of which reduce tailings mercury emissions compared to Twin Creeks.

- **Response to comments related to measurements**

Quarterly monitoring of mercury concentrations at the tailings storage facility will be conducted by Donlin Gold per ADEC's waste management permit requirement and allow verification of the tailings concentration estimates.

- **Response to comments related to linearity of stream response**

With regards to the comment that "higher mercury emission from the mine site will increase mercury concentrations in the streams", as explained in the Ramboll report, the net effect on stream water quality would be negligible and, in some cases, beneficial when considering Donlin Gold's runoff control measures which would reduce both geogenic and anthropogenic mercury loadings.

ATTACHMENT 3

Air Sciences Inc., “Review of May 9, 2022 Comments from Earthjustice” (May 12, 2022)



TECHNICAL MEMORANDUM

REVIEW OF MAY 9, 2022 LETTER FROM EARTHJUSTICE

PREPARED FOR: Eric Fjelstad, Perkins Coie
PREPARED BY: Kevin Lewis, Air Sciences
PROJECT NO.: 281-22B-1
DATE: May 12, 2022

Earthjustice provided a letter dated May 9, 2022 (Letter) to the Alaska Department of Environmental Conservation (ADEC) regarding the Donlin Gold Certificate of Reasonable Assurance. The Letter contained certain statements by Dr. Glenn C. Miller (Miller) which are addressed below to provide clarification.

Miller statement: “However, I still argue that the emissions from the Donlin thermal facility are underestimated, primarily since the modeling exercise of the Donlin facility is based on other facilities, and although the technology is mature, there remains an elevated uncertainty in the emissions from the thermal facilities.”

Clarification: The mercury emission estimates for the Donlin Gold thermal facilities are not underestimated and did not rely solely other facility data. The Donlin Gold estimates are conservatively high when compared to the two Nevada mines highlighted for comparison by Dr. Miller. This was clearly demonstrated in Table 2 of Attachment 3 of Donlin Gold’s letter dated April 14, 2022. The emission estimates were based on engineering process modeling, Nevada mercury control guidance, actual emissions data from equivalent units, and consideration of the site-specific conditions at the Donlin Gold facility.

Miller statement: “Finally, there is no indication that mercury emissions from the Donlin facility are going to be measured, as is required by Nevada regulations. The company should be required to actually measure the concentrations from the thermal facilities on a regular basis, as well as the concentrations of mercury in the tailings facility on a time and space varying basis to actually determine what those emissions will be.”

Clarification: The Donlin Gold thermal facilities will be subject to mercury emissions testing as well as ongoing monitoring of mercury emission controls pursuant to EPA’s National Emission Standards for Hazardous Air Pollutants: Gold Mine Ore Processing and Production Area

Source Category, 40 CFR 63.11640 - 11653. Furthermore, periodic monitoring of mercury concentrations at the tailings storage facility will be conducted by Donlin Gold per ADEC's waste management permit.

Miller statement: "The comment that only 15% of the ore will be autoclaved is curious, since autoclaving oxidizes sulfidic ore, and it is the cyanide after autoclaving that dissolves the mercury, in a manner similar to gold recovery. Thus, the autoclaving comment is rather meaningless."

Clarification: The percentage of ore that is oxidized in the autoclave process is meaningful because it is only this ore that is further processed/leached with cyanide. Ore that is not oxidized is sent directly to the tailings storage facility.